

**Remarks:**

**Preliminary Matters**

Claims 1 - 29 are pending in the present case, while new claims 30 - 35 have been added.

Applicant notes that the claims, as amended, include elements (a mixing slot, a heat exchanger, and a sensor channel) that were deemed patentably distinct in U.S. Patent No. 6,604,492 to Porter et al. (mixing slot and heat exchanger) and U.S. Application Serial No. 10/087,057, projected to issue on February 24, 2004, as U.S. Patent No. 6,694,809 to Porter et al. (sensor channel). If it is determined that a Terminal Disclaimer is required to obviate a potential Double-Patenting Rejection over these prior patents, the Examiner is invited to call Applicant's undersigned representative so that a Terminal Disclaimer can be filed in an expedited manner.

**35 U.S.C. § 102**

Claims 1 - 8, 10 - 11, 13, 16 - 22, 24 - 26, and 29 stand rejected under 35 U.S.C. § 102(b) as anticipated by the Almo reference, "What you can get in manifolds." Applicant respectfully submits that this reference cannot be located at [www.almomanifold.com](http://www.almomanifold.com), as suggested in the Office Action. Furthermore, there is no indication on the photocopy of Almo provided with the Office Action as to its date of publication. Applicant respectfully requests proof of the publication date of this reference if it is to be properly relied upon by the Examiner.

If it is determined that the publication date of Almo indeed satisfies 35 U.S.C. § 102(b), Applicant respectfully submits that the claims, as amended, are patentable over Almo for the reasons set forth below.

Almo discloses various types of manifolds, including a "sandwich-type manifold." Almo also discloses that each section in the sandwich has passages which route fluid to appropriate ports.

Independent claims 1, 10, 20, 26, and 29 (as amended) all recite elements that are neither disclosed nor suggested by Almo, namely a *mixing slot* formed in the first modular manifold (claims 1 and 26) or base (claims 10, 20, and 29) for atomizing the fluid and combining it with a gas stream using a venturi effect. Newly added dependent claims 31 - 35 (dependent upon independent claims 1, 10, 20, 26, and 29, respectively) further recite a *heat exchanger* in fluid communication with the mixing slot for vaporizing the atomized liquid.

By way of example, as shown in the embodiment depicted in Applicant's Fig. 13, a mixing slot 62 for atomizing a liquid into a gas stream and a mixture heating slot 72 for vaporizing the atomized liquid in the mixture are combined within the integrated fluid delivery

system. These features are found in the originally filed application at page 16, lines 8 - 10. No new matter has been added.

New claim 30 recites a sensor channel mounted below the system. By way of further example, as shown in the embodiment depicted in Applicant's Fig. 9, a sensor area 56 is mounted below base 16C of the integrated fluid delivery system. Sensor channel 52 extends downwardly from seamless slot 18C through a sensor plate 49 and into sensor area 56 of a sensor housing 61, such that sensor channel 52 is at a lower elevation than seamless slot 18C. These features are found in the originally filed application at page 13, lines 25 - 27. No new matter has been added.

Almo does not teach a *mixing slot for atomizing the fluid, a heat exchanger for vaporizing the atomized fluid, and/or a sensor channel mounted below the system*, and therefore fails to teach or suggest each and every limitation of Applicant's claimed invention.

Accordingly, for the foregoing reasons, Applicant requests reconsideration of the claims, as amended, and respectfully submits that independent claims 1, 10, 20, 26, and 29 (as amended) are patentable over Almo and should be allowed. Claims 2 - 9 are dependent upon claim 1, claims 11 - 19 are dependent upon claim 10, claims 21 - 25 are dependent upon claim 20, and claims 27 and 28 are dependent upon claim 26, and therefore should also be allowed at least as dependent upon allowable base claims.

**35 U.S.C. § 103**

Claims 12, 14, 15, and 23 stand rejected under 35 U.S.C. § 103(c) as unpatentable over Almo. Applicant respectfully traverses these rejections because, as noted above, Almo fails to recite each and every limitation of independent claims 10 and 20 upon which these claims depend.

Furthermore, the Office Action asserts that the use of an elliptic cross section for the grooves and the use of vacuum brazing and/or nickel brazing are considered to be obvious matters of design choice. The Office Action does not provide support for such assertions. Applicant respectfully requests proof of the obvious design choice assertion if it is to be properly relied upon by the Examiner.

Claims 12, 14, 15, and 23 ultimately depend from independent claims 10 and 20, as noted above. For the same reasons, Applicant contends that these claims are allowable as ultimately depending from allowable claims. Reconsideration of these claims is respectfully requested.

Claims 9, 27, and 28 stand rejected under 35 U.S.C. § 103(c) as unpatentable over Almo in view of U.S. Patent No. 5,488,925 to Kumada and U.S. Patent No. 6,244,575 to Vaartstra et


al. It is respectfully submitted, however, that the claims are patentable over the art of record for the same reasons set forth above.

In addition, the Office Action asserts that "vaporizer" is considered to read on "atomizer." The Office Action does not provide support for such an assertion. Applicant respectfully submits that "vaporization" and "atomization" are distinct processes. The McGraw-Hill Dictionary of Scientific and Technical Terms (copy of relevant pages enclosed) defines "vaporization," also known as volatilization, as "The conversion of a chemical substance from a liquid or solid state to a gaseous or vapor state by the application of heat, by reducing pressure, or by a combination of these processes." In contrast, "atomizer" is defined as "A device that produces a mechanical subdivision of a bulk liquid, as by spraying, sprinkling, misting, or nebulizing." In summary, "vaporizer" and "atomizer" are clearly distinct processes, as vaporization is a conversion of state by the application of heat, and atomization is a mechanical subdivision. As explained at page 18, lines 8 - 10 of the originally filed application, atomizing a liquid prior to vaporization lowers the temperature of vaporization, which may reduce degradation of certain liquid precursors. Accordingly, Applicant respectfully submits that claims 9, 27, and 28 are patentable over the art of record and should be allowed. Reconsideration of these claims is respectfully requested.

**Conclusion**

In view of the amendments and points of distinction set for above, Applicant contends that the above-identified application is in condition for allowance, which action is respectfully requested.

Respectfully submitted,

  
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BEL/EEF/dhm

Attachments: Dictionary Definitions

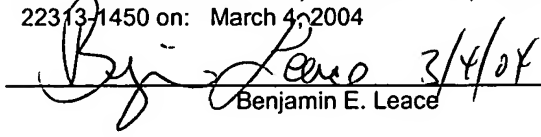
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On the cover: Photomicrograph of crystals of vitamin B<sub>12</sub>.  
(Dennis Kunkel, University of Hawaii)

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In addition, material has been drawn from the following references: R. E. Huschke, *Glossary of Meteorology*, American Meteorological Society, 1959; U.S. Air Force *Glossary of Standardized Terms*, AF Manual 11-1, vol. 1, 1972; *Communications-Electronics Terminology*, AF Manual 11-1, vol. 3, 1970; W. H. Allen, ed., *Dictionary of Technical Terms for Aerospace Use*, 1st ed., National Aeronautics and Space Administration, 1965; J. M. Gilliland, *Solar-Terrestrial Physics: A Glossary of Terms and Abbreviations*, Royal Aircraft Establishment Technical Report 67158, 1967; *Glossary of Air Traffic Control Terms*, Federal Aviation Agency; *A Glossary of Range Terminology*, White Sands Missile Range, New Mexico, National Bureau of Standards, AD 467-424; *A DOD Glossary of Mapping, Charting and Geodetic Terms*, 1st ed., Department of Defense, 1967; P. W. Thrush, comp. and ed., *A Dictionary of Mining, Mineral, and Related Terms*, Bureau of Mines, 1968; *Nuclear Terms: A Glossary*, 2d ed., Atomic Energy Commission; F. Casey, ed., *Compilation of Terms in Information Sciences Technology*, Federal Council for Science and Technology, 1970; *Glossary of Stinfo Terminology*, Office of Aerospace Research, U.S. Air Force, 1963; *Naval Dictionary of Electronic, Technical, and Imperative Terms*, Bureau of Naval Personnel, 1962; *ADP Glossary*, Department of the Navy, NAVSO P-3097.

### McGRAW-HILL DICTIONARY OF SCIENTIFIC AND TECHNICAL TERMS, Fifth Edition

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ated hydrogen atoms from an electric discharge source are formed into a beam that undergoes selective magnetic processing; can be used as an atomic clock. { ə'tām-ik 'hī-drə-jən 'mā-zər }

**atomic hydrogen welding** [MET] An arc welding process in which hydrogen gas dissociated by the arc recombines outside the arc to provide intense heat and protection against oxidation for the weld. { ə'tām-ik 'hī-drə-jən 'weld-ɪŋ }

**atomicity** [CHEM] The number of atoms in a molecule of a compound. { ə'də'mis-əd-ē }

**atomic magnet** [ATOM PHYS] An atom which possesses a magnetic moment either in the ground state or in an excited state. { ə'tām-ik 'mag-nət }

**atomic magnetic moment** [ATOM PHYS] A magnetic moment, permanent or temporary, associated with an atom, measured in magnetons. { ə'tām-ik 'mag-ned-ik 'mōm-ənt }

**atomic mass** [PHYS] The mass of a neutral atom usually expressed in atomic mass units. { ə'tām-ik 'mas }

**atomic mass unit** [PHYS] An arbitrarily defined unit in terms of which the masses of individual atoms are expressed; the standard is the unit of mass equal to one-twelfth the mass of the carbon atom, having as nucleus the isotope with mass number 12. Abbreviated amu. Also known as dalton. { ə'tām-ik 'mas 'yü-nət }

**atomic moisture meter** [ENG] An instrument that measures the moisture content of coal instantaneously and continuously by bombarding it with neutrons and measuring the neutrons which bounce back to a detector tube after striking hydrogen atoms of water. { ə'tām-ik 'mōis-çər, 'mēd-ər }

**atomic nucleus** See nucleus. { ə'tām-ik 'nü-klē-əs }

**atomic number** [NUC PHYS] The number of protons in an atomic nucleus. Also known as proton number. { ə'tām-ik 'nām-bər }

**atomic operation** [COMPUT SCI] An operation that cannot be broken up into smaller parts that could be performed by different processors. { ə'tām-ik, əp-ə'rā-shən }

**atomic orbital** [ATOM PHYS] The space-dependent part of a wave function describing an electron in an atom. { ə'tām-ik 'ōrb-ə-təl }

**atomic paramagnetism** [ELECTROMAG] The result of a permanent magnetic moment in an atom. { ə'tām-ik, par-ə'mag-nə-tiz-əm }

**atomic particle** [ATOM PHYS] One of the particles of which an atom is constituted, as an electron, neutron, or proton. { ə'tām-ik 'pārd-ə-kəl }

**atomic percent** [CHEM] The number of atoms of an element in 100 atoms representative of a substance. { ə'tām-ik 'pər-sent }

**atomic photoelectric effect** See photoionization. { ə'tām-ik 'fōd-ə'lek-trik 'i'fekt }

**atomic physics** [PHYS] The science concerned with the structure of the atom, the characteristics of the elementary particles of which the atom is composed, and the processes involved in the interactions of radiant energy with matter. { ə'tām-ik 'fiz-iks }

**atomic pile** See nuclear reactor. { ə'tām-ik 'pīl }

**atomic polarization** [PHYS CHEM] Polarization of a material arising from the change in dipole moment accompanying the stretching of chemical bonds between unlike atoms in molecules. { ə'tām-ik, pōl-ə-rā-zā-shən }

**atomic power plant** See nuclear power plant. { ə'tām-ik 'paʊ-ər-plānt }

**atomic radius** [PHYS CHEM] Also known as covalent radius. 1. Half the distance between the nuclei of two like atoms that are covalently bonded. 2. The experimentally determined radius of an atom in a covalently bonded compound. Also known as covalent radius. { ə'tām-ik 'rād-ē-əs }

**atomic reactor** See nuclear reactor. { ə'tām-ik rē-ak-tər }

**atomic rocket** [AERO ENG] A rocket propelled by an engine in which the energy for the jetstream is to be generated by nuclear fission or fusion. Also known as nuclear rocket. { ə'tām-ik 'rāk-ət }

**atomic scattering factor** [PHYS] A quantity which expresses the efficiency with which x-rays of a stated wavelength are scattered into a given direction by a particular atom, measured in terms of the corresponding scattering by a point electron. Also known as atomic form factor. { ə'tām-ik 'skad-ər-ɪŋ, 'fak-tər }

**atomic second** [PHYS] As defined in 1967, the duration of

9,192,631,770 periods of the radiation corresponding to the two hyperfine levels of the fundamental state of the atom of cesium-133. { ə'tām-ik 'sek-ənd }

**atomic spectroscopy** [SPECT] The branch of physics concerned with the production, measurement, and interpretation of spectra arising from either emission or absorption of electromagnetic radiation by atoms. { ə'tām-ik, 'spek-trās-kə-pē }

**atomic spectrum** [SPECT] The spectrum of radiations due to transitions between energy levels in an atom, either absorption or emission. { ə'tām-ik 'spek-trəm }

**atomic standard** [PHYS] Any supposedly immutable property of an atom, such as the wavelength or frequency of a characteristic spectral line, in terms of which a unit of a physical quantity is defined. { ə'tām-ik 'stan-dərd }

**atomic stopping power** [NUCLEO] For an ionizing particle passing through an element, the particle's energy loss per atom within a unit area normal to the particle's path; equal to the linear energy transfer (energy loss per unit path length) divided by the number of atoms per unit volume. { ə'tām-ik 'stāp-ɪŋ, 'paʊ-ər }

**atomic structure** [ATOM PHYS] The arrangement of the parts of an atom, which consists of a massive, positively charged nucleus surrounded by a cloud of electrons arranged in orbits describable in terms of quantum mechanics. { ə'tām-ik 'strək-çər }

**atomic surface burst** [ORD] An atomic missile burst at an elevation such that the fireball touches the ground. { ə'tām-ik 'sərfəs, 'bɜrst }

**atomic susceptibility** [ELECTROMAG] The magnetization of a material per atom per unit of applied field; measured in ergs per oersted per atom. { ə'tām-ik sə,sept-ə'bil-əd-ē }

**atomic theory** [CHEM] The assumption that matter is composed of particles called atoms and that these are the limit to which matter can be subdivided. { ə'tām-ik 'thē-ər-ē }

**atomic time** [HOROL] Any time system standardized with reference to an atomic resonance, such as the international standard cesium-133 transition. { ə'tām-ik, 'tīm }

**atomic underground burst** [ORD] The explosion of an atomic weapon with its center beneath the surface of the ground. { ə'tām-ik 'ən-dər, 'gräʊnd 'bɜrst }

**atomic underwater burst** [ORD] The explosion of an atomic weapon with its center beneath the surface of the water. { ə'tām-ik 'ən-dər, 'wōd-ər 'bɜrst }

**atomic unexcited state** See atomic ground state. { ə'tām-ik, 'ən-ek'sid-əd 'stāt }

**atomic units** See Hartree units. { ə'tām-ik 'yü-nəts }

**atomic vibration** [ATOM PHYS] Periodic, nearly harmonic changes in position of the atoms in a molecule giving rise to many properties of matter, including molecular spectra, heat capacity, and heat conduction. { ə'tām-ik, 'vī-brā-shən }

**atomic volume** [PHYS CHEM] The volume occupied by 1 gram-atom of an element in the solid state. { ə'tām-ik 'völ-yəm }

**atomic weapon** [ORD] Any bomb, warhead, or projectile using active nuclear material to cause a chain reaction upon detonation. Also known as atomic device; nuclear weapon. { ə'tām-ik 'wep-ən }

**atomic weight** [CHEM] The relative mass of an atom based on a scale in which a specific carbon atom (carbon-12) is assigned a mass value of 12. Abbreviated at. wt. Also known as relative atomic mass. { ə'tām-ik 'wāt }

**atomization** [ANALY CHEM] In flame spectrometry, conversion of a volatilized sample into free atoms. [CHEM] A process in which the chemical bonds in a molecule are broken to yield separated (free) atoms. [MECH ENG] The mechanical subdivision of a bulk liquid or malleable solid, such as certain metals, to produce drops, which vary in diameter depending on the process from under 10 to over 1000 micrometers. { ə'də-mā-zā-shən }

**atomizer** [MECH ENG] A device that produces a mechanical subdivision of a bulk liquid, as by spraying, sprinkling, misting, or nebulizing. { ə'də-mīz-ər }

**atomizer burner** [MECH ENG] A liquid-fuel burner that atomizes the unignited fuel into a fine spray as it enters the combustion zone. { ə'də-mīz-ər, 'bɜrnər }

**atomizer mill** [MECH ENG] A solids grinder, the product from which is a fine powder. { ə'də-mīz-ər, 'mil }

**atomizing humidifier** [MECH ENG] A humidifier in which

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of two or more molecules or ions that react to form a volatile substance. { 'vāl-ə'til-ə-ē ,prād-əkt }

**volatilization** [THERMO] The conversion of a chemical substance from a liquid or solid state to a gaseous or vapor state by the application of heat, by reducing pressure, or by a combination of these processes. Also known as vaporization. { 'vāl-əd-ə-l-ə-zā-shən }

**volborthite** [MINERAL]  $\text{Cu}_3(\text{UO}_4)_2 \cdot 3\text{H}_2\text{O}$  An olive green to green and yellowish-green, monoclinic mineral consisting of hydrated copper vanadate. { 'vāl,bōr,thīt }

**volcanello** See spatter cone. { 'vāl-kə-nel-ō }

**volcanic ash** [GEOL] Fine pyroclastic material; particle diameter is less than 4 millimeters. { 'vāl'kan-ik 'ash }

**volcanic bombs** [GEOL] Pyroclastic ejecta; the lava fragments, liquid or plastic at the time of ejection, acquire rounded forms, markings, or internal structure during flight or upon landing. { 'vāl'kan-ik 'bāmz }

**volcanic breccia** [PETR] A pyroclastic rock that is composed of angular volcanic fragments having a diameter larger than 2 millimeters and that may or may not have a matrix. { 'vāl'kan-ik 'brech-ə }

**volcanic foam** See pumice. { 'vāl'kan-ik 'fōm }

**volcanic gases** [GEOL] Volatile matter composed principally of about 90% water vapor, and carbon dioxide, sulfur dioxide, hydrogen, carbon monoxide, and nitrogen, released during an eruption of a volcano. { 'vāl'kan-ik 'gas-əz }

**volcanic glass** [GEOL] Natural glass formed by the cooling of molten lava, or one of its liquid fractions, too rapidly to allow crystallization. { 'vāl'kan-ik 'glas }

**volcanicity** See volcanism. { 'vāl-kə-nis-əd-ē }

**volcaniclastic rock** [PETR] Clastic rock containing volcanic material in any proportion. { 'vāl'kan-ə'klas-tik 'rāk }

**volcanic mud** [GEOL] Sediment containing large quantities of ash from a volcanic eruption, mixed with water. { 'vāl'kan-ik 'mād }

**volcanic mudflow** [GEOL] The flow of volcanic mud down the slope of a volcano. { 'vāl'kan-ik 'mād,flo }

**volcanic neck** [GEOL] A residual remnant of the pipe or throat of a volcano that was filled with solidified lava after its final eruption. { 'vāl'kan-ik 'nek }

**volcanic rift zone** [GEOL] A zone comprising volcanic fissures with underlying dike assemblages; occurs in Hawaii. { 'vāl'kan-ik 'rift ,zōn }

**volcanic rock** [GEOL] Finely crystalline or glassy igneous rock resulting from volcanic activity at or near the surface of the earth. Also known as extrusive rock. { 'vāl'kan-ik 'rāk }

**volcanics** [PETR] Igneous rocks that solidified after reaching or nearing the earth's surface. { 'vāl'kan-iks }

**volcanic theory** [ASTRON] A theory which holds that most features of the moon's surface were formed by volcanic eruptions, lava flows, and subsidences when lunar rocks were plastic. Also known as igneous theory; plutonic theory. { 'vāl'kan-ik 'thē-ə-rē }

**volcanic vent** [GEOL] The channelway or opening of a volcano through which magma ascends to the surface; two general types are fissure and pipelike vents. { 'vāl'kan-ik 'vent }

**volcanism** [GEOL] The movement of magma and its associated gases from the interior into the crust and to the surface of the earth. Also known as volcanicity. { 'vāl-kə,niz-əm }

**volcano** [GEOL] 1. A mountain or hill, generally with steep sides, formed by the accumulation of magma extruded through openings or volcanic vents. 2. The vent itself. { 'vāl'kā-nō }

**volcanology** [GEOL] The branch of geology that deals with volcanism. { 'vāl-kə'nāl-ə-jē }

**vole** [VERT ZOO] Any of about 79 species of rodent in the tribe Microtini of the family Cricetidae; individuals have a stout body with short legs, small ears, and a blunt nose. { 'vōl }

**Volhard titration** [ANALY CHEM] Determination of the halogen content of a solution by titration with a standard thiocyanate solution. { 'fōl,härt tī'trā-shən }

**volley** [ENG] A round of holes fired at any one time. [ORD] Burst of fire, especially a salute fired by a detachment of riflemen. { 'vāl-ē }

**volley bombing** [ORD] Simultaneous or nearly simultaneous release of a number of bombs. { 'vāl-ē ,bām-īŋ }

**volley fire** [ORD] Artillery fire in which each piece fires a specified number of rounds without regard to the other pieces and as fast as accuracy will permit. { 'vāl-ē ,fir }

**volt** [ELEC] The unit of potential difference or electromotive

force in the meter-kilogram-second system, equal difference between two points for which 1 coulomb of electricity will do 1 joule of work in going from one to the other. Symbolized V. { 'vōlt }

**Volta effect** See contact potential difference.

**voltage** [ELEC] Potential difference or electromotive force measured in volts. { 'vōl-tij }

**voltage amplification** [ELECTR] The ratio of the voltage across a specified load impedance to the input voltage of the amplifier or the voltage feeding that load; often expressed in decibels by common logarithm of the ratio by 20. { 'vōlt-ij ,shən }

**voltage amplifier** [ELECTR] An amplifier designed to build up the voltage of a signal, without supplying power. { 'vōl-tij ,am-plə,fī-ər }

**voltage-amplitude-controlled clamp** [ELECTR] A diode clamp in which the diode functions as a clamp; the potential at point A rises above  $V_R$ ; the diode is forward-biased condition and acts as a very low impedance. { 'vōl-tij ,am-plə,tūd kən'trōld 'klamp }

**voltage coefficient** [ELEC] For a resistor, the ratio of the fractional change in resistance to the change in voltage. { 'vōl-tij ,kō-ē ,fi- }.

**voltage-controlled oscillator** [ELECTR] An oscillator in which the frequency of oscillation can be varied by changing the voltage. Abbreviated VCO. { 'vōl-tij kən'trōld ,ōs-ilej-er }

**voltage corrector** [ELEC] Active source of regulated voltage; replaced in series with an unregulated supply to regulate the output voltage (or current), and to correct for variations in the input voltage by automatically varying its own output in proportion to the input voltage, thereby maintaining the total output voltage constant. { 'vōl-tij ,kə-rek-tər }

**voltage-current dual** [ELEC] A pair of circuit elements of one circuit are replaced by their dual elements in the other circuit according to the duality principle; the dual currents are replaced by voltages, capacitances by inductances. { 'vōl-tij ,kə-rənt ,dū-əl }

**voltage-dependent resistor** See varistor. { 'vōl-tij ,dē-pēnd-ēnt ,ri-zis-tər }

**voltage derating** [ELEC] The reduction of a voltage to extend the lifetime of an electric device or to permit operation at a high ambient temperature. { 'vōl-tij ,dē-rād-ēŋ }

**voltage divider** [ELEC] A tapped resistor, adjustable potentiometer, or a series arrangement of two or more resistors connected across a voltage source; a desired portion of the total voltage is obtained from the intermediate contact, or resistor junction. Also known as voltage divider. { 'vōl-tij ,di-vīd-ər }

**voltage doubler** [ELECTR] A transformerless rectifier circuit that gives approximately double the output voltage from a half-wave vacuum-tube rectifier by charging a capacitor during the normally wasted half-cycle and discharging it in series with the output voltage during the next half-cycle. { 'vōl-tij ,dāb-lər }

**voltage drop** [ELEC] The voltage developed across a component or conductor by the flow of current through it, or impedance of that component or conductor. { 'vōl-tij ,drɒp }

**voltage feed** [ELECTROMAG] Excitation of a transmitting antenna by applying voltage at a point of maximum voltage loop or antinode. { 'vōl-tij ,fēd }

**voltage flare** [ELEC] A higher than normal voltage supplied to exposure lamps for a short period to increase their brilliance. { 'vōl-tij ,fler }

**voltage gain** [ELECTR] The difference between the signal voltage level in decibels and the input signal voltage level in decibels; this value is equal to 20 times the common logarithm of the ratio of the output voltage to the input voltage. { 'vōl-tij ,gān }

**voltage generator** [ELECTR] A two-terminal circuit in which the terminal voltage is independent of the load through the element. { 'vōl-tij ,jen-ə-rād-ər }

**voltage gradient** [ELEC] The voltage per unit length across a resistor or other conductive path. { 'vōl-tij ,grād-ēŋ }

**voltage level** [ELEC] At any point in a transmission line, the ratio of the voltage existing at that point to an arbitrary voltage used as a reference. { 'vōl-tij ,lev-əl }

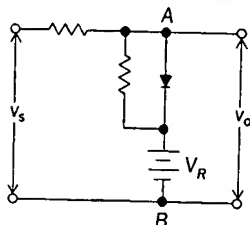
**voltage measurement** [ELEC] Determination of

VOLE

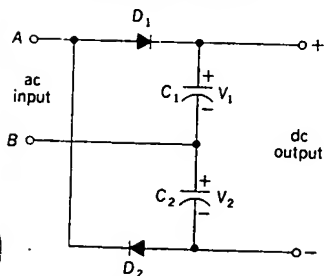


Vole showing characteristic features.

VOLTAGE-AMPLITUDE-CONTROLLED CLAMP

Circuit diagram of voltage-amplitude-controlled clamp circuit between terminals A and B. Diode functions as clamp whenever potential at A starts to rise above reference voltage  $V_R$ . Here  $V_s$  = signal voltage source;  $V_o$  = output voltage.

VOLTAGE DOUBLER

Circuit diagram of full-wave voltage doubler. When alternating-current input voltage is positive at terminal A, diode  $D_1$  conducts, producing voltage  $V_1$  across capacitor  $C_1$ . On other half cycle, diode  $D_2$  conducts, producing voltage  $V_2$  across capacitor  $C_2$ .